



2.2 Military specification.- The following Military specifications, of the issues in effect on date of the invitation for bids or request for proposals, form a part of this specification:

MIL-E-17555 Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

MIL-T-45208 Inspection System Requirements

VOLUME CONTROL AND MUTING PANEL

1. SCOPE

1.1 Scope.- The equipment specified herein is an assembly of six adjustable attenuators and six muting switches with which an operator can either mute or maintain an acceptable speaker level in any of six individual receiving channels. The equipment is assembled on a panel arranged for flush mounting in an operating console.

2. APPLICABLE DOCUMENTS

2.1 FAA specifications.- The following FAA specifications, of the issues specified in invitation for bids, or request for proposals, form a part of this specification:

- 3.1 Equipment to be furnished by the contractor.- Each equipment furnished by the contractor shall be complete in accordance with all specification requirements. Six connectors (3-8) shall be furnished with each complete unit. Instruction booklets shall be furnished in accordance with FAA-D-1272, in quantities specified in the contract schedule.
- 3.1.1 Nameplates.- Nameplates shall be in accordance with FAA-G-2100/1. The equipment title shall be VOLUME CONTROL AND MUTING PANEL.
- 3.2 Attenuator.- Each attenuator shall be of the bridged T-pad type employing variable elements. Each attenuator network shall be designed to dissipate 2 watts.
- 3.2.1 Resistor R₄.- Each resistor R₄ shall be 1 watt, 620 ohms $\pm 5\%$, composition type. The six resistors shall be mounted on an insulating panel (FAA-G-2100/1) secured on the rear of the mounting bracket. Timed-wire jumpers shall be soldered in place across the stud terminals (Figure 1), and performance requirements hereof shall apply with jumpers in place.
- 3.2.2 Impedance.- The impedance of each attenuator at 1000 Hz shall be 600 ohms $\pm 25\%$ from 0 to 100% rotation, measured at the input terminals with a 600 ohm noninductive resistor connected across the output terminals. Similarly, these requirements shall be met with measurements taken at the output terminals using the same 600 ohm noninductive resistor connected across the input terminals.
- 3.2.3 Attenuation versus rotation.- The attenuation shall be audio taper. With the attenuator shaft rotated to the extreme counterclockwise position, the network shall introduce not less than 29 dB of attenuation. Conversely, with the attenuator in the clockwise position, the attenuation shall not exceed 2 dB.

FAA-D-1272 Instruction Booklets, Electronic Equipment
FAA-G-2100/1 Electronic Equipment, General Requirements; Part 1, General Requirements for All Equipments
(Copies of this specification, and of other applicable FAA specifications and drawings, may be obtained from the Federal Aviation Administration, Washington, D. C. 20590, Attention: Contracting Officer. Requests should fully identify material desired, i.e., specification numbers, dates, amendment numbers, complete drawing numbers; also the request should identify the invitation for bid, request for proposal, or the contract involved or other use to be made of the requested material.)

3.3 Channel isolation. - With a 3000 Hz input signal level of +33 dBm applied to the input terminals of each channel, one at a time, the resultant output level present in each of the other channels shall be down not less than 50 dB referred to the input signal level. The above requirement shall be met with the gain controls of all channels rotated to their maximum clockwise positions. The wiring shall be twisted shielded pair.

3.4 Muting switches. - Each muting switch shall contain two sets of form "C" contacts (D.P.D.T.) and shall be of the nonlocking type, push-to-mute.

3.4.1 Muting resistor. - A 2-watt, 620 ohms $\pm 5\%$ fixed composition resistor (R5, Figure 1) shall be soldered on each switch to provide dummy loads for the respective receiver outputs (modifies FAA-G-2100/1).

3.4.2 Push buttons. - Two red push buttons shall be installed on the first two switches on the left of the front panel as viewed from the front. The remaining four push buttons shall be black.

3.5 Volume control knobs. - Two red knobs shall be installed on the first two volume controls on the left of the front panel as viewed from the front; the remaining four knobs shall be black (modifies FAA-G-2100/1). Set screws shall be hex socket and cup. The bottom of the skirt shall rest $1/16 + 1/32$ inch from the front panel surface. All knobs shall have pointers or white dot indicators.

3.6 Designation strip. - The designation strip shall be metal, complete with white bristol-board marking strip and transparent cover strip. The designation strip shall be secured to the front panel by means of flat head machine screws, in the location shown in Figure 1. The overall length of the strip shall be $4\frac{1}{2} + 1/16$ inches. The center of the strip shall be in line with the vertical centerline of the front panel. The distance between the mounting holes of the strip shall be determined by the contractor. The height of the strip shall be $9/16 + 1/16$ inch.

3.7 Receptacles. - The six input-output channel receptacles shall be 5 pin male, Amphenol No. 126-216 with locking ring or equal, and shall mate with Amphenol No. 126-223.

3.8 Connectors. - A mating connector for each of the receptacles, 3.7 above, shall be furnished. The connectors shall be 5 socket female, Amphenol No. 126-223 with hood and clamp, or equal, and shall mate with Amphenol No. 126-216.

3.9 Construction

3.9.1 Design and construction. - The Volume Control and Muting Panel shall be fabricated in accordance with the electrical and design features given on Figure 1 and in the following paragraphs.

3.9.2 Tolerances. - It shall be the contractor's responsibility to adopt mechanical tolerances which will insure correct fit in assembly of components. A tolerance of $\pm 1/64$ inch shall apply to the overall panel size dimensions and the spacing dimensions of the four corner holes (fig. 1).

3.9.2.1 Front panel. - Tolerances for the overall dimensions of the front panel shall be as specified for standard 19-inch panels indicated in FAA-G-2100/1.

3.9.2.2 Component mounting. - No component including the mounting bracket or hardware, shall be mounted closer than 7/16 inch from the edges of the front panel, so that the panel can be mounted on a flat surface over an opening not larger than 4-1/8 by 5-1/8 inches.

3.9.3 Bushings. - Brass or bronze bushings shall be installed in the second, fourth, and sixth holes of the front panel (as viewed from the front) through which the shafts of the three volume controls installed on the mounting bracket protrude. The inside diameter of the bushing shall be such that a minimum of play is obtained without causing the shafts to bind.

3.9.4 Volume control. - Volume controls shall be mounted on the front panel in holes one, three, and five as viewed from the front. Blind holes shall be made in the back of the front panel and the mounting bracket to facilitate the use of the volume control keys in order to prevent the control from slipping. Similarly, three controls shall be mounted on the mounting bracket. The shafts of these controls shall protrude through the bushings installed in the front panel (3.9.3).

3.9.5 Mounting bracket. - Holes shall be provided in the mounting bracket for securing the receptacles, the volume controls, and the required brackets. All holes shall be located as indicated in Figure 1. Care shall be taken in locating the volume control mounting holes to insure that the shafts do not bind in their mating holes in the front panel.

3.9.5.1 Captive nuts. - Captive nuts shall be used to secure the mounting bracket to the front panel.

3.9.6 Cabling. - The wiring for each channel shall be grouped together and laced in separate cables. The cables shall be long enough to allow the mounting bracket to drop three inches for accessibility to the mating switch terminations for ease of maintenance.

3.9.6.1 Wiring. - The wiring from the three volume controls located on the mounting bracket shall be fed through separate grommet holes located adjacent to each of the controls.

3.9.7 Finishes. - Finishes, including front panel and chassis finish, shall be in accordance with FAA-G-2100/1.

4. QUALITY ASSURANCE PROVISIONS

4.1 General. - The contractor shall provide and maintain a quality control program which fulfills the requirements of Military Specification MIL-I-45208, Inspection System Requirements. The contractor's quality program

shall be a scheduled and disciplined plan of events integrating all necessary inspections and tests required to substantiate product quality during design development, purchasing, subcontracting, manufacture, fabrication, processes, assembly, acceptance, packaging, and shipping; and where required, by the contract site installation. The contractor shall perform or have performed all inspections and tests required to substantiate product configuration and conformance to drawings, specifications, and contract requirements and shall also perform or have performed all inspections and tests otherwise required by the contract. An FAA representative will witness the contractor's testing and inspections and will perform such visual and other inspections as deemed necessary to assure compliance with contract requirements.

4.2 Design qualification tests. - The following design qualification tests shall be made under normal test conditions:

Attenuation versus Rotation

Paragraph 3.2.3

4.3 Type tests. - The following type tests shall be performed under normal test conditions:

Impedance

Paragraph 3.2.2

Channel Isolation

Paragraph 3.3

4.4 Production tests. - Each unit shall be inspected for standards of workmanship and tested to assure proper operation. Each volume control shall be rotated to insure that the control shafts do not bind.

5. PREPARATION FOR DELIVERY

5.1 General. - See MIL-E-17555.

6. NOTES

6.1 None.

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NOTES:

1. 6 HOLES REQUIRED FOR ATTENUATOR SHAFTS. HOLES 2, 4 AND 6 SHALL HAVE INSERTS INSTALLED ON THE FRONT PANEL FOR ATTENUATOR SHAFTS INSTALLED ON THE MOUNTING BRACKET.
2. DISTANCE BETWEEN HOLES USED FOR SECURING IDENTIFICATION STRIPS SHALL BE DETERMINED BY THE CONTRACTOR.
3. 6 HOLES REQUIRED FOR MOUNTING RECEPTACLES.
4. DO NOT SCALE.
5. R4 JUMPER AS SHOWN.

3 HOLE REQUIRED FOR MOUNTING ATTENUATORS.

4. DO NOT SCALE.

5. R4

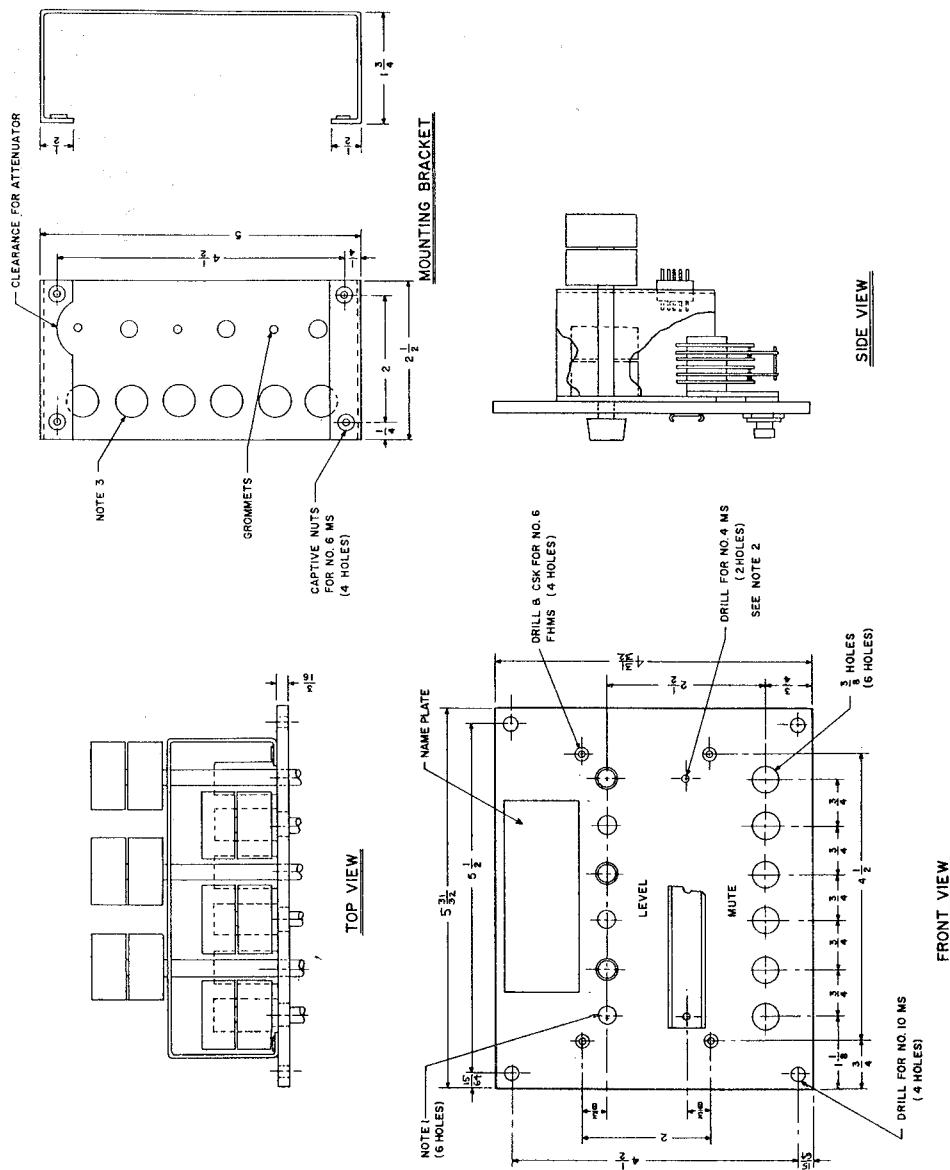


FIGURE 1
VOLUME CONTROL AND MUTING PANEL